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Report No.: SZEM150700468308
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RF Exposure Evaluation Report

Application No.: SZEM1507004683CR
Applicant: Disney Interactive Studios, Inc.
Manufacturer: Disney Interactive Studios, Inc.
Factory: Shenzhen King Chuang Tech&Electronic Co., Ltd.
Product Name: Disney Infinity Base INF-8040889
Model No.(EUT): INF-8040889
Trade Mark: Disney Infinity
FCC ID: QOF-8040889
Standards: 47 CFR Part 1.1307 (2014)
47 CFR Part 1.1310 (2014)
KDB447498D01 General RF Exposure Guidance v05r02
Date of Receipt: 2015-10-20
Date of Test: 2015-10-20 to 2015-10-28
Date of Issue: 2015-10-29

Test Result :	PASS*
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* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2015-08-18		Original
01		2015-10-29	Change adapter to FJ-SW2660501000U	Alternative report

Authorized for issue by:			
Tested By		2015-10-28	Date
	(Chris Zhong) /Project Engineer		
Prepared By		2015-10-29	Date
	(Iris Zhou) /Clerk		
Checked By		2015-10-29	Date
	(Sen Lv) /Reviewer		



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4 General Information

4.1 Client Information

Applicant:	Disney Interactive Studios, Inc.
Address of Applicant:	1200 Grand Central Avenue, Glendale, California, 91201 United States
Manufacturer:	Disney Interactive Studios, Inc.
Address of Manufacturer:	1200 Grand Central Avenue, Glendale, California, 91201 United States
Factory:	Shenzhen King Chuang Tech&Electronic Co., Ltd.
Address of Factory:	Block A, Mountain Top, Fuyuan Industrial Zone, Jiuwei, Xixiang Town, Shenzhen, China

4.2 General Description of EUT

Product Name:	Disney Infinity Base INF-8040889
Model No.:	INF-8040889
Trade Mark:	Disney Infinity
Sample Type:	Fixed production
Antenna Type:	Integral
Antenna Gain:	0dBi for Bluetooth 0dBi for RFID
Power Supply:	AC 120V/60Hz

4.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.



4.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

The 3m Semi-anechoic chambers and the 10m Semi-anechoic chambers of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-2, 4620C-3.

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.



5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	30
30–300	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



**SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch**

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4.1.3 EUT RF Exposure Evaluation

1) exposure conditions for standalone operations

For Bluetooth

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.00 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max. Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	MPE Ratios	Result
Lowest	2402	-5.68	0.27	5.37*10 ⁻⁵	1.0	5.37*10 ⁻⁵	PASS

Note: Refer to report No. SZEM150700468305 for EUT test Max Conducted Peak Output Power value.

The distancer (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For RFID

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.00 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max. Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit	MPE Ratios	Result
13.56	13.56	-38.22	1.51*10 ⁻⁴	0.3*10 ⁻⁷	0.98	0.3*10 ⁻⁷	PASS

Note: Refer to Test Report SZEM150700468302 for EUT test Max Conducted Peak Output Power value.

The distancer (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

2) exposure conditions for simultaneous transmission operations

Simultaneous transmission MPE test is not required, because the Max. sum of the MPE ratios for BT and RFID is $5.37 \times 10^{-5} + 0.3 \times 10^{-7} < 1$

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